$$\int \sec^2(ax+b)dx = \frac{\tan(ax+b)}{a} + C$$

Tips:

1. Integrating $\sec^2(x)$ gives a tanx graph
2. When integrating trig, always think of double angle formulas!
   - $\int 2\sin x \cos x dx = \int \sin 2x dx$
   - $\int \cos(2x)dx = \cos^2 x - \sin^2 x$
   - $\int \cos(2x)dx = 1 - 2\sin^2 x$
   - $\int \cos(2x)dx = 2\cos^2 x - 1$
3. Remember trig identities
   $\sin^2\theta + \cos^2\theta = 1$
   $\tan^2\theta + 1 = \sec^2\theta$
   $1 + \cot^2\theta = \csc^2\theta$
4. Change $\int \tan x \rightarrow \int \sin x/\cos x = -\ln(\cos x) + C$
   Change $\int \cot x \rightarrow \int \cos x/\sin x = \ln(\sin x) + C$

12.3 WORKED EXAMPLE

$\int \tan^2 3x \sec^2 3x dx$

12.4 WORKED EXAMPLE

$\int 4\sec^4 x \tan x dx$